

Abstract

The invention includes a MIMO channel emulator that includes a channel emulator matrix. The channel emulator matrix receives N inputs and generating M outputs. The channel emulator matrix includes a plurality of splitters. Each splitter receives at least one of the N inputs, and each splitter generates a plurality of signal paths.

The channel emulator matrix further includes at least one phase shifter. Each phase shifter adjustably shifts a phase of at least one signal path. The channel emulator matrix further includes a plurality of combiners. Each combiner receives more than one of the plurality of signal paths. At least one of the combiners receives a phase adjusted signal path, and each combiner generates at least one of the M outputs. The invention can also include a plurality of fading emulators. Each fading emulator receives at least one emulator input. The plurality of emulators generate the N splitter inputs. The fading emulators can include fading delay lines. The fading emulators can be adjusted so that each of the M outputs are not fully correlated with each of the other M outputs. The invention can also include a plurality of second splitters. Each second splitter receives at least one channel input signal. Each second splitter generates a plurality of second signal. This embodiment further includes at least one second phase shifter. Each second phase shifter adjustably shifts a phase of at least one second signal. This embodiment further includes a plurality of second combiners. Each second combiner receives more than one of the plurality of second signal paths. At least one second combiner receives a phase adjusted second signal path. Each second combiner generates at least one of the fading emulator inputs.